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CHARGING STAND HAVING OPEN AND CLOSED POSITIONS

This invention relates to charging stands, and more particularly, to charging stands having a cover that can be closed for storage of a rechargeable appliance such as a hair trimmer, beard trimmer or the like, or opened and set on a table with the appliance in a raised position.

BACKGROUND OF THE INVENTION

Charging stands have been used for storing rechargeable hair trimmers and other appliances and charging their internal batteries. The charging stand typically has a base and a cradle. The stand supports the hair trimmer in an inclined position. Power is provided through contacts in the charging stand, which in turn receives power through a power cord that is routed under or behind the base of the charging stand.

When traveling, the stand must be taken to charge the clipper, but the stand is bulky and awkward to pack, and the clipper is typically packed separately, usually uncovered. Thus, there is a need for compact charging stands that can be conveniently packed in luggage. There is also a need for storage devices for appliances such as hair trimmers and other rechargeable personal care items.

## SUMMARY OF THE INVENTION

In keeping with one aspect of the invention, a charging stand for selectively enclosing and exposing an appliance such as a hair trimmer having a rechargeable battery includes a base and a cover. The base has an access opening for supporting the appliance, and electrical contacts for charging the battery. The cover fits over the base to define an interior space for enclosing the appliance, and can be secured to the base in at least two positions. In a first position, the cover encloses the appliance with the base. In the second position, the cover exposes the appliance when the appliance is in a raised position.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a charging stand of the present invention in an open position, with a rechargeable hair trimmer in the charging stand;

FIG. 2 is a perspective view of the charging stand of FIG. 1, in a closed position;

FIG. 3 is an exploded view of the base of the charging stand of FIG. 1;

FIG. 4 is a front elevation view of the charging stand of FIG. 1, in the open position;

FIG. 5 is a top view of the charging stand of FIG. 1, in the open position;

FIG. 6 is a back view of the charging stand of FIG. 1, in the closed position;

1           FIG. 7 is a bottom view of the charging stand of FIG. 1, in the open  
2 position; and

3           FIG. 8 is a top view of the charging stand of FIG. 1, in the closed  
4 position.

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6           DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

7           Referring now to FIGs. 1-4, a charging stand 10 holds a portable  
8 rechargeable appliance 12 in a base 14 for storage and recharging purposes. The  
9 rechargeable appliance 12 is shown as a hair trimmer, but the present invention is  
10 contemplated as being utilized with other rechargeable electric devices or appliances  
11 including shavers, clippers or the like, using rechargeable batteries and recharging  
12 bases or stands. Alternatively, the stand 10 may hold an appliance that does not have  
13 rechargeable batteries or require recharging on the stand.

14           The rechargeable unit 12 includes a housing 16 with a working end 18  
15 which, as illustrated, is equipped with a bladeset 20. On the opposite end of the  
16 housing 16 from the working end 18 is a charging end 22. The charging end 22 may  
17 have a pair of contacts (not shown) for charging an internal rechargeable battery or  
18 batteries.

19           The charging stand 10 includes a cover 26 for supporting the base 14  
20 upon a substrate such as a table, countertop or shelf when the charging stand is in a  
21 fully open position, as in FIG. 1. As seen in FIG. 2, the base 14 and the cover 26 can  
22 also be arranged in a closed position. In the closed configuration, the charging stand

1 10 is generally cylindrical with a narrow central region 28, a rounded top region 30  
2 and a rounded bottom region 32.

3 The base 14 has essentially the same configuration as the cover 26, so  
4 that the cover fits on the base when the cover 26 is closed to form a case. The base 14  
5 and cover 26 may be plastic or any other suitable material, and may be opaque, or  
6 clear for viewing the rechargeable unit 12 through the storage unit 10.

7 Referring now to FIGS. 3 and 4, the base 14 has a front piece 33 that  
8 rests inside a rear piece 35. The front piece 33 has an upper end 34 including a top  
9 wall 36, opposed side walls 38 and a rear wall 40 defining a base interior space 43.  
10 As illustrated, the opposed side walls 38 and the rear wall 40 form a unitary curved  
11 surface corresponding to the curvature of the unit 12. However, the present invention  
12 also contemplates separate and distinct walls which accommodate the unit 12. Top  
13 wall 36 is inclined with respect to the longitudinal axis of the charging stand 10, to  
14 accommodate the blades of the hair trimmer, and is located in the rounded top region  
15 30 between the opposed side walls 38 and above the rear wall 40.

16 A panel 42 is also disposed on the rounded top region 30 of the front  
17 piece 33 above the top wall 36 and extends along two sides of the base interior space  
18 43, outwardly disposed from the side walls 38. The rear piece 35 has an edge 44  
19 adjacent to the side panel 42, and a lateral detent (not shown) which is continuous  
20 around the side panel. The side panel 42 fits inside the edge 44.

21 The base 14 defines a docking recess 47 for receiving the rechargeable  
22 appliance 12. The front of the recess 47 is formed by the front piece 33, and the back

1 of the recess 47 is formed by the rear piece 35. The front of the recess 47 may have a  
2 graphics area 31 for brand identification or other indicia.

3 As seen in FIG. 5, the upper end 34 of the base 14 supports the  
4 rechargeable unit 12 (not shown in FIG. 5) when docked in the recess 47. A floor 52  
5 which is provided with at least one and generally two contacts 56 is disposed at the  
6 bottom of the docking recess 47.

7 Typically, there are two contacts on each of the rechargeable unit 12  
8 (contacts not shown) and the base 14 which are located in adjacent relationship to  
9 each other. While the preferred embodiment has two contacts 56, it is contemplated  
10 that the number and positioning of the contacts may vary to suit the application, such  
11 as a personal digital assistant or other digital device, provided there is at least one  
12 contact 56 constructed and arranged for making physical and electrical contact with a  
13 contact on the rechargeable unit 12. Recharging is achieved by the electrical  
14 connection between the rechargeable unit 12 contacts and the base 14 contacts, and  
15 the connection is typically maintained through the physical engagement of the  
16 corresponding metallic contacts on both the unit and the base.

17 The contacts 56 may be configured for causing an enhanced, more  
18 consistent wiping contact action between the contacts on the rechargeable unit 12 and  
19 the contacts 56 on the base 14. In the preferred embodiment, the wiping engagement  
20 is created by the contacts 56 forming an inclined surface above the floor 52, defining  
21 an inverted "U" shape. It is also contemplated that the contacts 56 need not project

1 through the floor 52, but may be flush or recessed, depending on the configuration of  
2 the contacts on the rechargeable unit 12.

3 Also included in the docking recess 47 is a curved wall 58 which  
4 follows the curvature of the housing 16 of the rechargeable unit 12. The docking  
5 recess 47 forms a receptacle for the charging end 22 and the curved wall 58 extends  
6 upwardly a length suitable to maintain the rechargeable unit 12 in the recess.  
7 Extending over the outer periphery of the curved wall 58 at each side of the docking  
8 recess 47 is the side panel 42. The side panel 42 is molded to the front part that forms  
9 the recess 47, to form the front piece 33. Ends 60 of side walls 38 are angled such that  
10 the edge portions 62 of the side walls are further from the top region 30 than the back-  
11 side portion 63 (best seen in FIG. 1).

12 For inserting and removing the rechargeable unit 12, an access opening  
13 68 is defined by the curved wall 58 and walls 36, 38 and 40 of the base 14. During  
14 insertion of the rechargeable unit 12 into the base 14, as illustrated in FIG. 1, the  
15 charging end 22 is received in the access opening 68 of the docking recess 47 and is  
16 removably coupled to the base by sliding the housing 16 until the trimmer 12 engages  
17 the floor 52. An electrical connection results as the contacts on the rechargeable  
18 trimmer 12 touch the contacts 56.

19 Referring now to FIGS. 1-6, the base 14 includes a bottom 70 which is  
20 generally perpendicular to the longitudinal axis of the base, and forms an enclosure 71  
21 (shown in FIG. 3) between the bottom 70 and the floor 52 of the docking recess 47.  
22 The enclosure houses the contacts 56 which protrude through the floor 52, two female

1 sockets 74 and 76, and a printed circuit board 72 or the like that connects the contacts  
2 and sockets so that a male connector of a power supply can be inserted in either socket  
3 74 or 76. In the preferred embodiment, when the charging stand 10 is in a closed  
4 position and laying on the rear piece 35 of the base, as in FIG. 2, power can be  
5 delivered to the rechargeable unit 12 through a power cord 80 inserted into the socket  
6 74.

7 A rounded side 82 and an angled side 84 are located on either side of the  
8 bottom 70, the angled side having a generally oval shape and forming a generally 45-  
9 degree angle with the bottom. Located above the angled side 84 on the rear piece 35  
10 of the base 14 is an inclined recess 86 for the socket 76. The recess 86 has a bottom  
11 88 inclined perpendicular to the direction of inclination of the recess. Centrally  
12 disposed on the recess bottom 88 is the socket 76, configured to receive the male end  
13 of the cord 80 when the charging stand 10 is in an open position, or when the socket  
14 74 is otherwise inaccessible (best seen in FIG. 7).

15 Above the inclined recess 86 is an elongated groove 94 which generally  
16 forms a "V" in profile. Two opposing groove sides 96 are disposed laterally across  
17 the rear piece 35 of the base 14. Due to the generally rounded shape of the base 14,  
18 the depth of the groove 94 from the surface of the rear piece 35 is greatest at the center  
19 and tapers towards the sides of the groove. Located on one of the groove sides 96 are  
20 two protrusions 97. The groove 94 and the protrusions 97 are configured to engage  
21 the cover 26 when the charging stand 10 is in the fully open position.

1                   Referring now to FIG. 7, the cover 26 is generally half cylindrical and  
2 hollow, having an upper end 98 and a lower end 100. The upper end 98 includes a top  
3 wall 102, opposed side walls 104, and a rear wall 106 defining a cover interior space  
4 108. As illustrated, the top wall 102, the opposed side walls 104 and the rear wall 106  
5 form a unitary, curved surface corresponding to the curvature of the unit 12.  
6 However, the present invention also contemplates separate and distinct walls which  
7 accommodate the unit 12.

8                   Located at the lower end 100 of the cover 26 are two legs 110  
9 longitudinally aligned with the upper end 98 of the cover 26. Two feet 112 are  
10 disposed at the end of legs 110 on both sides of a groove receiving edge 114 and are  
11 pivotably engaged with the base 14 at the bottom region 32. The feet 112 have a  
12 generally perpendicular alignment with the legs 110 (best seen in FIG. 1) and have an  
13 outside width not extending beyond the widest part of the charging stand 10. A pivot  
14 point 116 is generally located in the bottom region 32.

15                   As seen in FIG. 8, the cover 26 has a peripheral edge 120 along an upper  
16 end 98 which is suitable for mating with the base 14 when the stand is closed. At the  
17 upper end 98, the top wall 102 is curved outwardly away from the base 14 at a central  
18 curve 124 and the base has a suitable latch 126. Mating of the top wall 102 and the  
19 upper end 34 of the base 14 at the latch 126 helps retain the cover 26 and the base in a  
20 substantially closed position during shipment or storage.

21                   In order to convert the charging stand 10 to an open position, the cover  
22 26 and the base 14 are first separated by releasing the latch 126. Once separated, the



1 cover 26 is pivoted beneath the base 14 approximately 315 degrees until the groove  
2 receiving edge 114 of the cover 26 engages the groove 94. The base 14 is supported  
3 by the cover 26 at the groove receiving edge 114 and the access opening 68 of base 14  
4 is exposed for inserting or removing the rechargeable unit 12.

5 In this fully open position, the base 14 and the cover 26 form  
6 approximately a 45-degree angle, although an upright position or any angle of  
7 inclination suitable for retaining the rechargeable unit 12 within the base 14 is  
8 contemplated. The angled side 84 of the bottom 70 is angled such that when the  
9 groove receiving edge 114 engages the groove 94, the angled side lays flat on the table  
10 or other substrate. Also contacting the table and supporting the base 14 are the feet  
11 112, now normal to the substrate, and the top wall 102 of the cover 26. The central  
12 curve 124 of the cover 26, however, does not contact the table, as seen in FIG. 1, but  
13 forms an opening 128 with the substrate in which the power cord 80 can be fed to the  
14 socket 76. As a result, power can be delivered to the rechargeable unit 12 while the  
15 storage unit 10 is in any open position.

16 While particular embodiments of the charging stand have been shown  
17 and described, it will be appreciated by those skilled in the art that changes and  
18 modifications may be made thereto without departing from the invention in its broader  
19 aspects and as set forth in the following claims.